



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Gopal B. Avinash et al.

Serial No.: 10/723,859

Filed: November 26, 2003

For: METHOD AND SYSTEM TO
REDUCE MOTION RELATED
IMAGE ARTIFACTS DURING
BREATH HOLDING

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Group Art Unit: 3737

Confirmation No.: 9691

Examiner: Mehta, Parikha Solanki

Atty. Docket: 139943-1/YOD/RAR
(GEMS:0256)

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October 23, 2007
Date

Eddie Lou Robinson
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

In light of the following remarks, Appellants respectfully request review of the final rejection in the above-referenced application. No amendments are being filed with this Request. This Request is being filed with a Notice of Appeal. In the Final Office Action, the Examiner rejected claims 1-32 and 35. Claims 1-32 and 35 remain pending in the present application. Appellants respectfully request reconsideration of the pending claims in view of the following remarks.

Legal Error of Rejections of Claims 1-32 and 35

In the Final Office Action, the Examiner rejected claims 1-8, 10-20, 22-32, and 35 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,363,844 (the “Riederer reference”). The Examiner also rejected claims 9 and 21 under 35 U.S.C. § 103(a) as obvious in view of the Riederer reference. Of these, claims 1, 13, 25, and 35 are independent. Appellants respectfully traverse these rejections.

Legal Precedent

During patent examination, the pending claims must be given an interpretation that is reasonable and consistent with the specification. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969); *see also* M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is “the primary basis for construing the claims.” *See Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (citations omitted). To be sure, one should rely heavily on the written description for guidance as to the meaning of the claims. *See Phillips*, at 16.

Legal Deficiency

The Examiner, contrary to legal precedent (e.g., the *Phillips* case discussed above), has apparently ignored or given little weight to the present specification. Instead, the Examiner has improperly relied upon extrinsic evidence in construing the language of the claims. In particular, independent claims 1, 25, and 35 recite, in generally similar language, generating a set of gated images using one or more gating intervals derived from an initiation threshold and a termination threshold. In addition, independent claims 1, 13, 25, and 35 all recite, in generally similar language, the termination threshold is derived from one or more attributes of motion from a set of motion data acquired during a breath hold. This is further clarified by reference to the present application where it is explained that the termination threshold is determined based on motion data and that the gating intervals are derived from the initiation and termination thresholds. *See, e.g.*, Application, page 1, lines 23-26; page 4, lines 4-7; page 11, lines 11-15. For instance, gating intervals may occur when pulmonary motion is minimal, such as subsequent to an exhalation but prior to an inhalation. *Id.*, page 4, lines 4-7. Therefore, it is clear from the claims,

and reinforced by the specification, that gating intervals are determined based upon motion data (e.g., when motion slows to a certain level or speeds up to a certain level).

In spite of the apparent sufficiency of the claim language and of the discussion in the specification, the Examiner has relied upon extrinsic evidence to define the term “gate.” Specifically, the Examiner cited Merriam Webster’s dictionary definition of the term “gate” as “a device (as in a computer) that outputs a signal when specified input conditions are met <logic gate>.” Final Office Action, page 2 (emphasis in original). From this dictionary definition the Examiner surmised, in obvious hostility to both the claim language and the teachings of the specification, that the term “gate” should be interpreted to mean “any interval in which specified conditions for imaging are met.” *Id.* at 3.

The Examiner further proceeded to use this interpretation of the term “gate” to suggest that the Riederer reference teaches a gating interval as claimed despite the fact that the Riederer reference instead appears to teach the use of an imaging interval which continues for a set time period (e.g., up to twenty seconds) before terminating. *See, e.g.*, Riederer, col. 2, lines 3-13; col. 5, lines 41-43. In other words, the Riederer reference does not appear to teach the use of gating intervals derived from motion data, as presently claimed. In summation, the Examiner’s use of extrinsic evidence, here a general purpose dictionary, to define terms which the specification clearly explains constitutes legal error. More precisely, the dictionary definition of the term “gate” relied upon by the Examiner is associated with electronics in general and bears only a tangential relation to the meaning understood by those skilled in the art in the specific field of imaging, as discussed in the specification.

Independent Claims 1, 13, 25, and 35

Independent claims 1, 13, 25, and 35 each generally recite deriving a termination threshold from one or more motion attributes. The Riederer reference, however, does not appear to disclose such a termination threshold derived from one or more attributes of motion. Instead, the Riederer reference only discloses that, once data acquisition is initiated, it continues for a set time period (e.g., up to twenty seconds) before terminating. *Id.* In other words, there is no termination threshold based on motion in the Riederer reference, and termination of data acquisition instead appears to be based upon a set time (which appears to correspond to the length of a breath-hold) elapsing. *Id.* Indeed, it appears to be assumed by the Riederer reference

that the patient will merely continue to hold still during a breath-hold until image acquisition is complete so there is no reason why the Riederer reference would disclose a termination threshold based on motion. *Id.*, col. 6, lines 62-66.

However, the Examiner stated that “Riederer (‘844) terminates imaging when the diaphragm is moving, which accordingly constitutes a termination threshold based on motion.” Final Office Action, page 2. Unfortunately, the Examiner did not provide a specific reference within the Riederer reference to support this conclusory statement. *Id.* Furthermore, upon close reading of the Riederer reference, Appellants are unable to find any suggestion that imaging terminates when the diaphragm begins moving. To the contrary, as noted above, all instances in the Riederer reference appear to characterize the data acquisition as continuing for a set time period. Riederer, col. 2, lines 3-13; col. 5, lines 41-43. To the extent that the Reiderer reference discusses diaphragm motion, it is to provide visual feedback to the patient allowing the patient to suspend respiration consistently, i.e., to hold their breath with their diaphragm in a consistent position so that the image acquisition can be initiated. *Id.*, Abstract; col. 2, lines 3-7. If, indeed, the Reiderer reference does teach the termination of imaging based upon the motion of a diaphragm, Applicants respectfully request that the Examiner provide a citation to this teaching, as required under 37 C.F.R. § 1.104(c)(2).

Dependent Claims

The present dependent claims are believed to be allowable due to their dependence from the independent claims discussed above. In addition, however, Appellants note that the present dependent claims 2-12, 14-24, and 26-32 are also believed to be allowable for the subject matter they separately recite. For example, dependent claims 6 and 18 generally recite the selection of a set of gated image data from a set of image data. Such subject matter appears to be absent from the Riederer reference. Further, in view of the subject matter described in the Riederer reference, one would not expect such subject matter to be disclosed. In particular, the Riederer reference appears to relate to the initiation of acquisition of image data based on diaphragm location, i.e. differential acquisition. *Id.*, col. 5, lines 26-41, 48-50; col. 6, lines 29-66. As recited in claims 6 and 18, however, the set of gated image data is selected from a set of image data, i.e., selection is retrospective based on already acquired data. In other words, the recitations of claims 6 and 18 involve selecting a set of gated data from a larger set of image data, i.e., the acquisition isn’t

differential, the selection of a subset of gated data from a larger set of image data is. Such subject matter appears to be entirely absent from the Riederer reference.

Likewise, dependent claims 10 and 22 recite the act of determining if one or more scan parameters are satisfied. Such subject matter is discussed in the specification at page 15, line 6 to page 16, line 15. This subject matter also appears to be entirely absent from the Riederer reference. The Examiner summarily dismissed this argument stating that “[i]t is noted that the features upon which Applicant relies (i.e. matter in pages 15 and 16 of the specification) are not recited in the rejected claim(s).” Final Office Action, page 2. However, clearly, such subject matter is recited in claims 10 and 22 and finds support on pages 15 and 16 of the specification which discloses the use of scan parameters during respiration gating techniques. Application, page 15, line 6 – page 16, line 15. Furthermore, dependent claims 10 and 22 recite, in generally similar language, determining if one or more scan parameters are satisfied. Such subject matter appears to be entirely absent from the Riederer reference.

In view of the various deficiencies of the Riederer reference noted above, no *prima facie* case of anticipation or obviousness is believed to exist with regard to independent claims 1, 13, 25, and 35. Furthermore, those claims depending from independent claims 1, 13, 25, and 35 are believed to be allowable at least for their dependence from their respective independent claims.

Conclusion

In view of the above remarks, Appellants respectfully request that the Panel instruct the Examiner to withdraw the outstanding rejections under 35 U.S.C. §§ 102 and 103 and allow the pending claims.

Respectfully submitted,

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